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ABSTRACT

According to the author, a review of occupational changes and alternative views of occupations leads to the following conclusions: (1) Occupational mobility--job changing--is a fact of life in the American economy and is likely to continue. (2) The way occupations are generally examined through national surveys does not consider how an individual's abilities or a job's requirements influenced this change. (3) A variety of alternative schemes has been developed for looking at jobs and occupations. Each relies on one or more common elements present in work situations and describes jobs in the ways they relate to this common element. (4) Very few attempts have been made to look at occupational mobility through these schemes, or to test the validity of these schemes through an analysis of occupational mobility. These conclusions point to two primary needs. The first is to continue the search for ways of identifying elements in jobs and individual's abilities that make occupational changes happen. The second is to be creative in examining the actual job movement of individuals through studies of job and occupational mobility. (This document includes a discussion of data collection methods and studies on occupational mobility, and alternative views of occupations--worker trait groups, functional job analysis, and self-directed search.) (TA)

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OCCUPATIONAL MOBILITY AND CAREER PLANNING:

What is Needed?

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THE CENTER MISSION STATEMENT

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- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

PREFACE

The Second Career Education National Forum, held in Washington, D.C. in February 1976, was evidence of The Center's continuing commitment to research and development in career education. Prominent researchers and academicians were joined by leading practitioners in a second nationwide effort to share ideas, research, and operational programs in career education. We are hopeful that this exchange will lend insight to and impact upon future developments at federal, state and local levels.

The Center is indebted to the National Institute of Education, sponsor of the Forum, for its support and advice in Forum planning. We also appreciate the time and efforts of those presenters who shared their insights with us all.

The Ohio State University and The Center are proud to share this paper with you.

Robert E. Taylor, Director
The Center for Vocational Education

INTRODUCTION

A little over a year ago, I was indulging in one of our national pastimes--watching the evening news on television--when one of the stories caught me up short. The time was not long after thousands of Vietnamese had arrived in the U.S. and were going through the difficult process of getting settled and getting a job.

The news story was about a young man who had been a fighter pilot in the national air force. Naturally, he was looking for a civilian position that would relate to his experience. As the conversation with the counselor progressed he learned that the requirements for commercial pilots would not let him get a job immediately, but that they would look for something "in a related field." The counselor made a few phone calls and ended up giving the young man the name and address of an airline office where he could go to interview for a job as a flight attendant--what used to be called an airline stewardess. The young man left the counselor's office apparently grateful for the help he had received.

That story did not go through my mind without jarring some of the grey matter. I came to regard this incident as a vivid portrayal of how much difficulty we have in relating occupations to one another and in making decisions about what kinds of jobs to look for when we either want to or have to.

It also struck me that we are captives of our concepts--the terms and categories we use to look at the jobs in our economy.

The research and development work of the National Institute of Education described below did not begin that night. It had been under consideration for some time. This story simply put the need in bold relief.

As background to this project, I will discuss:

I. Occupational Changes--what we know and how we look at them.

II. Alternative Views of Occupations.

III. What is Needed.

I. OCCUPATIONAL CHANGES

What do we know about occupational mobility? Both a lot and a little. Studies of occupational mobility ought to be done with longitudinal surveys of many people over long periods of time. Only in the last decade and a half have we begun to commit the money and manpower to do such surveys on a national basis. Without these longitudinal studies, we have had to examine patterns of occupational mobility by comparing studies of America's occupational structure taken at various points in time. Let me describe what we have learned from both types of studies.

Research Evidence

1. Jaffe – Carlton Study

One of the first attempts to examine occupational mobility patterns over a long time period was made by Jaffe and Carlton twenty years ago.[1] Since they did not have longitudinal data available to them, Jaffe and Carlton used a cohort analysis technique with data from the 1930, 1940 and 1950 Census, and a study of labor market behavior in six cities during the 1940's.

In a chapter on the patterns of working life, they looked at occupational mobility over a worker's lifetime. (Their data represent men only.) Estimating a working life to be about 40-45 years, they examined mobility between major occupational groups. Two conclusions are particularly noteworthy:

> Only about one man in five remains in the same major occupation group for his entire working life. The other four men move about from occupation to occupation such that their final occupation is in a quite different category from the one in which they began working.
>
> Of those who begin working in a white collar job, a little over half end their careers in a white collar occupation. Of those who begin in a manual occupation, about two-thirds end in a manual job. (pp. 56-57)

Since these categories of occupations are so broad (a point we shall return to later) it is fair to say that four out of five people moving from one major occupational group to another was a conservative estimate of the amount of occupational mobility and job change a person experiences in a lifetime.

2. Bureau of Labor Statistics Studies

The Bureau of Labor Statistics has conducted two studies of occupational mobility, in 1965 and in 1972.[2] Both surveys were conducted in years when the unemployment rate was declining, the first from 4.8 to 3.9 percent; the second from 5.9 to 5.0 percent. In both surveys, the overall rate of occupation change in one year was almost 9 percent. In the latter year, another 6.5 percent of the employed workers changed employers, but not occupations.

Thus, of all the people employed in January 1972, nearly one out of every seven—a total of over 11 million persons—had a new employer and/or a new occupation twelve months later.

3. Parnes Study

The Bureau of Labor Statistics Study says rates of occupational change are higher for younger workers—but don't let that fool you. Dr. Herbert Parnes reported in his nationally representative sample of men aged 45-59 one out of every five had a different employer reported in 1966—between 2.5 and 2.8 million men in 3 years.[3]

4. The Census in 1970

For the first time in history, the decennial census asked individuals what occupation they had at a previous time. Data are reported on occupations in 1965 and 1970 for every worker in the United States.[4] Of the persons working in 1965, one out of every three had a different occupation in 1970.

In an article published in the January 1977 issue of the *Monthly Labor Review*, the Bureau of Labor Statistics has documented that not only did individuals change occupations (of which there are over four hundred) but the odds were much better than two to one that they would change major occupational group as well as their occupation.[5]

These snatches of information on occupational mobility point to one thing: people change occupations. To the best of our ability, we can estimate that occupational change has been a fact of life for American workers for the last four decades. While the future is difficult to predict, occupational change will probably continue to be a fact of life in our economy, even if the future does not include the high rates of growth that we have become accustomed to.

What is the importance of this for educators concerned with "school to work and work to school?" I think the answer is simple. Educators have always accepted a responsibility for preparing individuals for a role in the world of work—in all our programs, not only those specifically oriented to job training. Moreover, we are becoming increasingly aware of the role we have in serving the needs of those who have completed the compulsory years of schooling and who are faced with several job changes in the next 40 years.

What do these studies tell us about our role or how we can improve our contribution? I believe they don't tell us very much. The reasons are rooted in the ways we have collected data on occupations.

The categories of occupations used by the Bureau of the Census, the Bureau of Labor Statistics, Jaffe, Carlton, Parnes, and the vast majority of other surveys rely on the categorization scheme of the U.S. Bureau of the Census. This scheme, which included over 400 occupations in 1970 has been the subject of considerable discussion, debate and revision. Despite the changes for the 1970 Census the basic purpose of the scheme has not changed. It was originally designed to classify individuals according to socioeconomic class ". . . with a minor regard to the occupations they pursue or to the particular part of the industrial field in which they work."[6]

As educators, we ask simple questions about occupations. How much education is required for a given occupation? How many jobs in the future will require high school or college degrees? Many have heard the projection that by 1980 only 20 percent of the jobs in our economy will require college degrees. Where does this estimate come from?

The data, collected by the Census and published by the Bureau of Labor Statistics, do not contain any reference to the training or educational requirements for specific occupations. The system is not designed to gather this information. The only way such requirements are determined from this source is on the basis of years of educational attainment of the current and past incumbents of these occupations. The projection that only 20 percent of the jobs will require degrees will certainly not become true, because, with the rising educational attainment of our population, more than 20 percent of our economy's jobs will be filled by persons who have college degrees.[7]

So the projections based on these data don't tell us what the education and training *requirements* are for various occupations, nor can they really tell us what changes should be brought about to make the educational/training process more efficient, both for society and for individuals.

A recent study by Gerald P. Glyde sought to define and measure underemployment in a way that would enable us to recommend changes in education and training programs. His definition of underemployment is a useful one:

> Underemployment . . . is defined as an involuntary employment condition where individuals are working in jobs, either part-time or full-time, in which their skills, including formal training and work experience, are undervalued and/or technically underutilized.[8]

When it came to measuring underemployment and answering simple questions such as "How many people are underemployed?" "Where are they in the labor market?" "What is causing their underemployment?" he concluded that we simply don't know. The information to make these judgments simply does not exist, and the few potential sources of information have not been analyzed with a view toward answering these questions.

If this is the case, and I believe there is general agreement that it is, we who are faced with helping students to prepare for jobs and careers have little empirical and factual basis on which to base our recommendations. We who are faced with designing policies and programs for these students have an inadequate data base to do our work.

Moreover, if we continue to examine patterns of occupational mobility using the Census categories, we will learn little about the skill requirements of various occupations or jobs and the incremental training or educational requirements needed by individuals who want to move into available jobs. Another very important facet of the phenomenon which will be neglected is an analysis of the individual skills and abilities which make occupational change easier.

II. ALTERNATIVE VIEWS OF OCCUPATIONS

While the occupational categories of the Bureau of the Census are the most widely used for gathering and analyzing occupational data, they are not the only ways we have of looking at occupations. Let me mention some alternatives.

Worker Trait Groups

The *Dictionary of Occupational Titles, (DOT),* the book most people know of, but few understand, does not simply list 22,000 or more jobs. The third edition of the *Dictionary* collects all job titles into 114 groups called Worker Trait Groups.[9] Each worker trait group is comprised of occupations that are similar in the actual work performed, the activities and abilities required, the training needs, and the access routes. One group called "Classifying, Filing and Related Work" lists 70 job titles in more than a dozen industries which have similar characteristics. Another group, "Operating and Controlling" includes over 1,200 titles with similar characteristics and requirements in over 20 industries (Chart 1).

For decades the Employment Service of the Department of Labor has been using these Worker Trait Groups and the General Aptitude Test Battery in its counseling and placement programs. The Battery includes tests of cognitive ability and aptitudes in areas such as general learning ability, verbal aptitude, numerical aptitude, form perception, motor coordination and manual dexterity. An individual's scores on these various tests can then be used to indicate one or more worker trait groups and specific job titles for which the person shows both ability and interest.

More recently, these same concepts and trait groups have been the foundation for the Career Decision-Making Program being developed by Mr. Dave Winefordner at the Appalachia Educational Laboratory, Charleston, West Virginia. This program, soon to be available for both secondary and post-secondary school levels, adapts the range of occupational and trait group information to language and information sources that can easily be used by counselors and students alike for placement or guidance purposes.

Functional Job Analysis

A prominant aspect of the *DOT's* analysis of jobs is its description of the individual's interaction with data, people, and things in performing the job. The Upjohn Institute, under the intellectual leadership of Dr. Sidney Fine, has developed this concept of Functional Job Analysis (FJA) based on interaction with data, people and things into a process for thinking about and analyzing the work people do.[10] Every job, this approach contends, requires that the employee relate to data, people and things. Central to this analysis is the determination of the functional skills required to do the job.

CHART 1

TWO WORKER TRAIT GROUPS

	Operating-Controlling	Classifying, filing, related work
The Work	Setting up, starting, adjusting, watching, stopping machines	Gather, sort, file records, forms and correspondence
The Requirements	Understand machines; perceive differences in shapes, forms; coordinate eyes, hands, feet	Read for pertinent information; do arithmetic computations; close detail work; follow instructions and procedures
Preparation Time	Six months to two years	30 days to one year
Interests	Prefer non-social activities with processes, machines and techniques; tangible productive satisfaction	Prefer business contact with people prefer routine, concrete, organized and non-social contact with processes and machines
Temperament	Adjustment to evaluation of information against criteria and precise limits and standards	Adjust to short cycle of repetative operations under specific instructions with little or no room for judgment
Physical	Objects weighing 20 to 100 lbs.	Objects weighing max. 20 lbs.
Number of Titles	Over 1,200	Over 70

Source: U.S. Department of Labor, Manpower Administration, *Dictionary of Occupational Titles*, Volume II, Washington, D.C.: U.S. Government Printing Office, 1965, pp. 276 and 435.

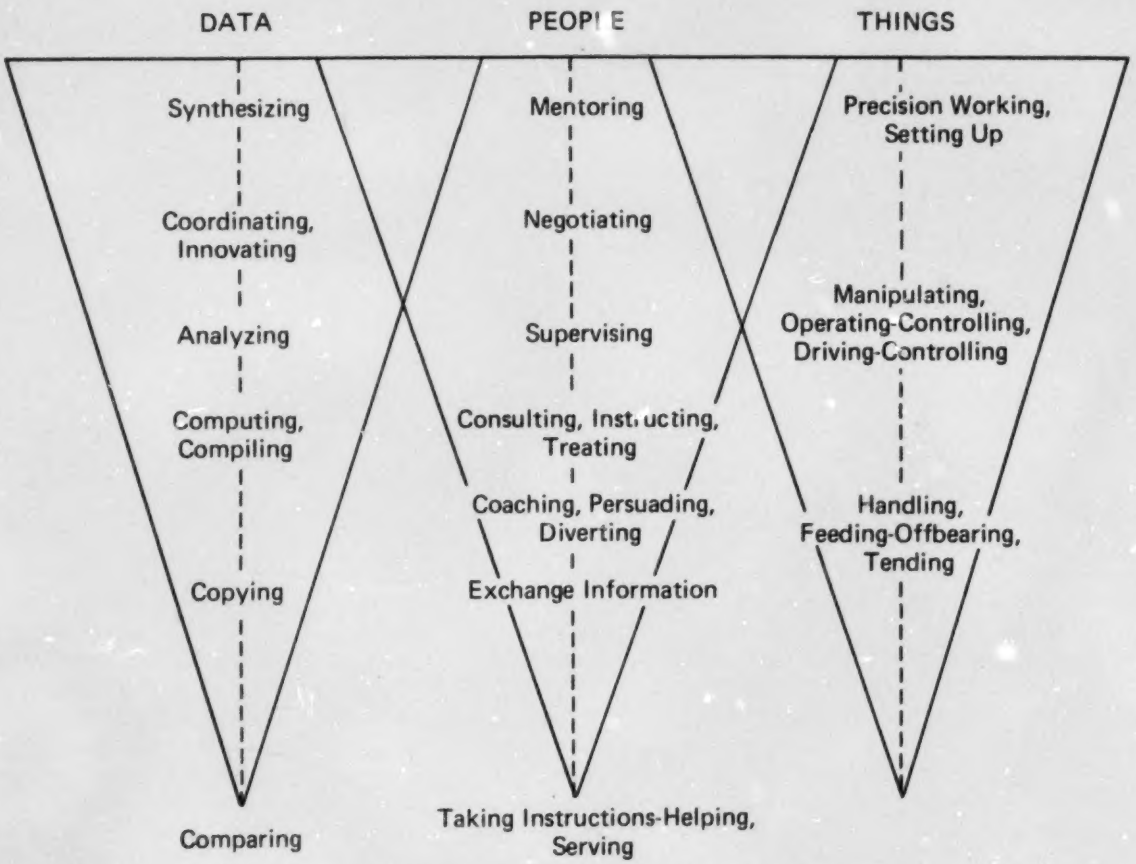
Functional skills refer to those competencies that enable an individual to relate to Things, Data and People (orientation) in some combination according to personal preferences and to some degree of complexity appropriate to abilities (level). They include skills like tending or operating machines; comparing, compiling or analyzing data; and exchanging information with or consulting and supervising people. These skills are normally acquired in educational, training, and vocational pursuits and are reinforced in specific job situations.[11] (Chart 2.)

Among its various applications, this approach has been used in at least two vocational interest inventories: The Ohio Vocational Interest Survey (OVIS) and the Hall Occupational Orientation Inventory.

CHART 2

FUNCTIONAL JOB ANALYSIS

SUMMARY CHART OF WORKER FUNCTION SCALES



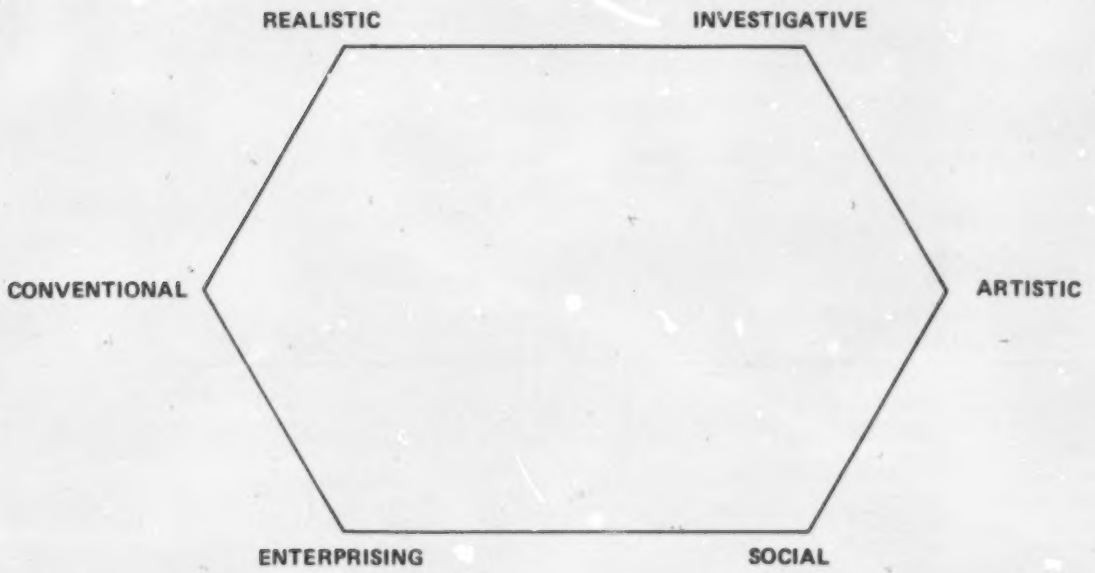
Self-Directed Search

Dr. John Holland of Johns Hopkins University has devoted most of his professional life to developing the program of self-directed search for making career choices. This program has a different approach from that of the DOT and FJA.

At the heart of Holland's system lies the conviction that individual characteristics and work environment characteristics can be matched.[12] In fact, the process of individual career decision-making is aimed at finding the best fit between individual characteristics and the work environment.

CHART 3

HOLLAND'S SIX TYPES



Holland identifies these six characteristics which describe the occupations in the U.S. as Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Most work situations involve a combination of these six. Thus, there is a set of occupations which combine Realistic, Investigative, and Enterprising elements. These occupations would entail explicit, ordered or systematic manipulation of tools, objects, machines or animals; the observation and investigation of physical, biological or cultural phenomena; and the manipulation of others to attain organization or self-interest goals.

Holland has identified occupations which combine these elements including civil engineers, aircraft mechanics, watch repairmen, radio mechanics, plumbers and roofers, and several more. [This set of occupations (Realistic, Investigative, and Enterprising occupations) employ over 7 million people in 1970, or almost 10 percent of the employed civilian labor force.[13]]

CHART 4

HOLLAND'S OCCUPATIONS

Realistic, Investigative, and Enterprising

Automotive Engineer
Mechanical Engineer
Engineer, Mining
Civil Engineer
Industrial Engineer Technician
Mechanical Engineer Technician
Aircraft Mechanic
Air Traffic Controller
Automobile Mechanic
Watch Repairman
Boilermaker
Draftsman
Electroplater
Garage Foreman
Farmer (Rancher)
Lineman (tel. & tel.)
Loom Changer
Machine Repairman
Machinist
Maintenance Man
Millwright
Mechanic, Radio
Mechanic
Plumber
Sheet Metal Man
Automobile Body Repairman
Compressor House Operator
Engraver, Machine
Forging Press Operator
Heavy Equipment Operator
Roofer
Upholsterer
Logger
Tool Crib Attendant

Planning for Career Development

What is the importance of these alternatives for classifying occupations for the task of improving occupational mobility and career planning? Their promise is in being able to look at work in ways that will uncover the differences in skill and ability requirements for various occupations and for grouping occupations according to these skill and ability requirements.

In addition to being used in individual industries or firms to improve the employee selection and evaluation process, these classification systems could also be used to monitor our economy's progress in preparing people for jobs; to assist our citizens in making progress through the world of work, e.g., to have a career; and to identify the skills and abilities which our education/training institutions impart to their graduates.

One interesting application for these latter purposes is illustrated in a study done sometime ago for the Office of Management and Budget. In many ways it offers a more satisfying examination of the relationship between job requirements and individual educational attainment.

The employment of people responding to the October 1966 Current Population Survey, a nationally representative sample of 35,000 households, was coded according to the categories of the *Dictionary of Occupational Titles* as well as the standard Census categories. This allowed a one-time examination of the jobs people are doing on the basis of the information reported in the *DOT*. The comparison of educational requirements according to *DOT* analyses and the actual educational attainment of people in those jobs is enlightening.[14]

The key to such a comparison is linking the General Educational Development requirements of various occupations (estimated by the *DOT*) to educational attainment of employed individuals. We could agree, for example, that employed persons with only high school graduation would be expected to have achieved levels of development consistent with the following:

Reasoning Development:

> Apply principles of rational systems to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret variety of instructions furnished in written, oral, diagrammatic, or schedule form.

Mathematical Development:

> Algebra: Deal with systems of real numbers; linear, quadratic, rational, exponential, logarithmic, angle and circular functions, inverse function; related algebraic solution of equations and inequalities; limits and continuity, probability and statistical inference.
>
> Geometry: Deductive axiomatic geometry, plane and solid, using properties of real numbers; use of rectangular coordinates.
>
> Shop Math: Practical application of fractions, percentages, ratio and proportion, measuration, logarithms, slide rule, algebra, geometric construction, essentials of trigonometry.

Language Development:

> Reading: Read novels, poems, newspapers, periodicals, journals, manuals, dictionaries, thesauruses, and encyclopedias.
>
> Writing: Business letters, expositions, summaries, reports, using prescribed format and conforming to all rules of punctuation, grammar, diction and style.
>
> Speaking: Participate in panel discussion, dramatizations, and debates. Speak extemporaneously on a variety of subjects.

If we agreed to this set of abilities as applicable to workers having completed a high school education, we could compare the requirements of the jobs to actual educational attainment. Doing this, Dr. Ann Miller found that just under half of the occupations in our economy in 1966 required development to this level. At the same time, four out of five of the employed persons had achieved this level, as evidenced by their completion of 12 or more years of education.

Having made these comparisons, Dr. Miller concludes:

> . . . it is hard to escape the conclusions that the high level of educational attainment in this country reflects a much broader set of social values than those related to purely occupational requirements. (p. 39)

Dr. Miller chose to equate the standards of reasoning, mathematical and language development described above with what could be expected of an individual who had completed *at least* four years of high school. She concluded that one fourth (25 percent) of the work force was employed *below* this level of educational achievement. If she had chosen these same levels of development as representative of those who had completed *something more than* four years of high school, she would

have concluded that one fourth (25 percent) of the work force was employed *above* thir level of educational achievement.

The importance of her work to our present concern is not to suggest that we have solved the problem of describing underemployment or the matching of educational attainment with job requirements. Its importance lies in showing that the data collected regularly can be subjected to analyses using categories other than those of the Census Bureau.

Dr. Miller's work is not unique. Using her study and a replication of the survey in 1971, Dr. Lloyd Temme of the Bureau of Social Science Research has identified values for each of the detailed 1970 census occupations in level and kind of involvement with people, data and things; required General Educational Development; and the specific training time required to become proficient in the work required.[15]

Studies related to the work of John Holland and his associates have already undertaken analyses of occupational distribution and mobility using his six descriptive categories. The results indicate that occupational change among occupations with similar characteristics is significantly higher than movement among dissimilar occupations, lending strength to the argument that this matching process is important in making career decisions.[16]

Another study using project TALENT data has analyzed the developing career plans of people from the high school years through age 28, or 11 years later.[17] They examined the implications of using three different classification schemes for occupations—John Holland's, Anne Roe's, and John Flanagan's. The underlying structures of each of these classification schemes and the hypothesized directions of career change were supported, although not overwhelmingly, for each of these systems.

Conclusions

This brief review brings us to several conclusions:

- Occupational mobility—job changing—is a fact of life in the American economy. It has been in the past and is likely to continue.
- The way we generally examine occupations through our national surveys does not enlighten us about how an individual's abilities or a job's requirements influenced this change.
- A variety of alternative schemes has been developed for looking at jobs and occupations. Each relies on one or more common elements present in work situations and describes jobs in the ways they relate to this common element.
- Very few attempts have been made to look at occupational mobility—job changes—through the filters of these schemes, or to test the validity of these schemes through an analysis of occupational mobility.

III. WHAT IS NEEDED

From our perspective there are two primary needs. The first is to continue the search for ways of identifying elements in jobs and individual's abilities that make occupational changes happen. As educators, then, we will be able to identify more clearly the skills and abilities which will prepare an individual not only for a job but for the series of jobs that will be his/her career.

The second is to be creative in the ways we examine the actual job-movement of our citizens, through our studies of job and occupational mobility. We have more information now about the job movement of individuals than we had a decade ago. We also have a variety of filters—conceptual schemas—through which we can look at this experience. We have to be creative in choosing the filter to suit our needs.

The project being conducted by The Center for Vocational Education under NIE sponsorship is designed to explore the issue of transferable skills.[3] These are the skills and abilities which an individual brings with him/her from job to job, and which apply to each job.

The project will attempt to examine the state of the art and practice with relation to transferable skills. This will be done initially by commissioning three papers, each written to briefly describe the research completed to date and to identify significant questions for future research. The papers will focus on the following three issues:

1. What are transferable skills?

   A review of what is known about an occupation in terms of related skills and competencies that could be considered transferable from one occupation to another, concentrating on those which are teachable.

   At first blush, these would include the basic literacy skills, multiple-use technical skills such as those described in the Worker Trait Groups, problem solving and decision-making skills. This paper will focus on bringing greater clarity and precision to the notion of transferable skills.

2. Who are the occupationally mobile?

   This will be a review of the research related to people who change jobs (not limited to those who are "upwardly" mobile). We want to find out if we know more than their basic demographic characteristics. Are data available on personality characteristics, prior work experiences and skills they possess which minimize the need for training to facilitate the move.

3. What characteristics of jobs are considered common?

   A variety of classification systems have been developed to look at occupations. Some were discussed above, such as Fine's contention that every job can be looked at in terms

of the employee's interaction with data, people, and things. Other candidates include levels of responsibility exercised, tools and machinery used, the psychological characteristics of the work environment, etc.

This paper will identify the several characteristics of jobs that have been considered common, emphasizing those which include skills and abilities teachable in educational institutions.

In the second phase of the project we will be looking for information sources about occupational and job mobility. Some have already been identified; other possibilities include special surveys by corporations, professional or union organizations, follow-up studies of users of various career development programs, such as Holland's or the Ohio Vocational Interest Survey.

We will be looking for sources of information about job and occupational changes that will be useful in analyzing the role transferable skills might play in these changes.

Building on the initial work of the third paper, we will continue to examine schemes for job analysis and occupational classification in an attempt to identify which might be most useful in the study of transferable skills. There are literally dozens of ways that various individuals and groups describe jobs and occupations. Some have been designed for guidance purposes, others for curriculum development, still others to determine job ladders and compensation rates. Rather than begin a new scheme, we suspect that one or more of these could be used to further our search.

While we are conducting these searches we will also be asking one question: "What difference does it make?" If we had a better understanding of what transferable skills are and how to teach them, what impact might it make for those who are responsible for hiring and promotion decisions. We will be meeting several times with representatives of various industries and professional organizations to discuss the importance of questions about transferable skills and the application of this knowledge to their work.

In the course of these discussions we will also be developing examples of practical applications to illustrate how a better understanding of transferable skills might be used by educators and employers alike. These applications might include:

a. A competency transcript given to a program graduate at any level certifying him/her in a variety of skills areas, accompanied by a listing of jobs for which these proficiencies qualify him/her.

b. A sample resume for young inexperienced individuals to highlight their talents and abilities that fit a range of possible positions;

c. A job application form emphasizing the level of developed skills and abilities prior to employment;

d. An employer's or union's recruiting brochure outlining the career ladders available to entry level employees in various jobs, including potential transfers to other career ladders with additional/supplemental training.

e. An instrument or form by which an employer might survey the pool of potential job talent existing among present employees.

f. A college/program catalog showing how the specifications of transferable skills would modify course organization, curriculum offerings, and information for students.

FOOTNOTES

[1]A. J. Jaffe and P. O. Carlton, *Occupational Mobility in the United States,* New York: King's Crown Press, 1954.

[2]James J. Byrne, "Occupation Mobility of Workers," *Monthly Labor Review,* February 1975 (also Special Labor Force Report Number 176); and Samuel Saben, "Occupational Mobility of Employed Workers," *Monthly Labor Review,* June 1967 (also Special Labor Force Report, 84).

[3]Herbert S. Parnes, *The Pre-retirement Years,* Volume 3, Manpower Research Monograph, No. 15, 1972, Chapter 3.

[4]U.S. Bureau of the Census, Census of the Population, *1970 Detailed Characteristics,* Final Report PC(1)-D1, U.S. Government Printing Office, 1973, Table 230.

[5]Dixie Sommers and Alan Eck, "Occupational Mobility in the American Labor Force," *Monthly Labor Review,* January 1977, pp. 3-19.

[6]Alba M. Edwards, *Comparative Occupational Statistics for the United States,* 1870-1940, Washington, D.C.: U.S. Bureau of the Census, 1943, p. 175, cited in Robert C. Dauffenbach, Jr., *The Structure of Occupational Mobility in the U.S. Economy,* Urbana, Illinois: Center for Advanced Computation, 1973, p. 93.

[7]There is already ample evidence that college graduates are taking jobs that college graduates did not traditionally take. See: Richard B. Freeman, "Youth Employment Opportunities: Changes in the Relative Position of College and High School Graduates," *Labor Market Information for Youths,* ed. Seymour L. Wolfbein, Philadelphia: Temple University, 1975, p. 101.

[8]Gerald P. Glyde et al., "Underemployment: Definition, Causes and Measurement," University Park, Pennsylvania: Institute for Research on Human Resource, 1975, p. 34, ERIC Number ED107862.

[9]U.S. Department of Labor, Manpower Administration, *Dictionary of Occupational Titles,* 1965, Volume II, Occupational Classification and Industry Index, Third Edition, Washington, D.C.: U.S. Government Printing Office, 1965.

[10]Sidney A. Fine and Wretha W. Wiley, *An Introduction to Fundamental Job Analysis,* The W. E. Upjohn Institute for Employment Research, September 1971. ERIC Accession No. ED060221.

[11] Ibid., p. 79.

[12] John L. Holland, *Making Vocational Choices: A Theory of Careers.* Englewood Cliffs, N.J.: Prentice Hall, 1973.

[13] Based on data reported by the U.S. Bureau of the Census, Census of the Population, *1970 Detailed Characteristics,* Final Report PC(1)-D1, United States Summary, Washington, D.C.: U.S. Government Printing Office, 1973, Table 222.

[14] Ann R. Miller, "Occupations of the Labor Force According to the *Dictionary of Occupational Titles,*" A report prepared for the Manpower Administration of the U.S. Department of Labor under research Contract No. 81-40-69-13. Mimeographed, no date.

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[17] Donald H. McLaughlin and David V. Tiedeman, "Eleven-Year Career Stability and Change as Reflected in Project Talent Data through the Flanagan, Holland and Roe Occupational Classification Systems," *Journal of Vocational Behavior,* October 1974, p. 177.

[18] This project is being conducted by The Center for Vocational Education, The Ohio State University, 1960 Kenny Road, Columbus, Ohio 43210, under the direction of Dr. Frank Pratzner. Requests for more information about the progress of the project should be directed to The Center.